

Low Power Pitfalls

by John Deveck

[BALTIMORE, Maryland - May 2004] One of the great things about low power broadcasting is that *anyone* can do it. Or, so the salespeople will tell you. It is a fairly easy thing to get into and to do legally, but there are a lot of “gotchas” out there waiting to snag the unwary, less cynical and naïve among us. So, let us cover up some of those pitfalls and make your startup a bit safer. Warning: This column will contain a lot of required reading and the FCC has the right to administer a pop quiz!

WISHFUL THINKING

When I was doing sales and system design for Part 15 equipment, it never ceased to amaze me how many people came to the table with bad information. It used to be word of mouth, but the advent of the internet has allowed an exponential growth in the spread of bad information. The most common questions people ask me stem from misinterpretations or misrepresentations made on the internet. It seems the more they wanted it to be true, the harder they argued that it was so—even when I read the Rules out of the book.

For the sake of generalization, we will drift around various systems under Part 15. There are AM and FM systems, antennas, radiating cables and carrier current options. We have gone through all of this in past columns (which you can find on the **Radio Guide** site) so there is no reason to repeat all the system details. But, we will talk about the Rules, equipment choices, installation issues, finding help and what to watch for when doing all of this. I feel the need to hammer on some of this information because it keeps coming up and it keeps getting misread.

ARM YOURSELF

Let us start with an easy one: Read Part 15. Yes, it is that simple. There are several searchable versions of it available on the web, for free, or you can purchase a printed copy from <http://bookstore.gpo.gov/sb/sb-281.html> (Parts 0-19 for \$61). The October 2003 version has just been released.

The fine folks in DC have made the whole Code of Federal Regulations available on line, at http://www.access.gpo.gov/nara/cfr/waisidx_01/47cfr15_01.htm, while the ever generous Harold Hallikainen has also created a free, easily searched version of the regulations on his site at <http://hallikainen.com/FccRules/>. You probably should also read the referenced sections of Part 15 and Part 2, which cover some of the equipment manufacturing regulations, like connections and such.

The FCC has also provided their interpretation of the Rules at <http://www.fcc.gov/mb/audio/lowpwr.html>. These are important to read and understand. *Before* you head off to buy any equipment, learn the Rules and the way the Rule enforcers interpret them; you will know more than many of the people trying to sell you things!

Perhaps we should clear up the biggest issue first—FM. I will repeat something I said in a previous column because it is *always* getting misprinted on the web: *There is no Rule that allows 100 milliwatt FM transmitters.* Any salesperson that tells you otherwise is *wrong*. You, having read the Rules before you went off in search of new gear, already know this and can ask them to cite the Rule that allows this. When they cannot, you either can hang up on them, or read them the Rule so that they will be better prepared next time.

The Rule is Part 15.239 for FM systems and it is a field strength Rule. To reach that field strength limit with a common radio antenna (about 32 inches) you need about

18 milliwatts. Much more and you will go right on past the field strength limit and be illegal. The confusion stems from Part 15.221, which covers 100 mW transmission on AM *only*. But you are not confused any more, are you?

BADGES?

YES YOU NEED STINKING BADGES

All equipment operating under the Part 15 Rules requires FCC Certification in an independent test facility. This is no longer true of Part 73 and other devices, which only require Verification by the manufacturer. But this helps you make sure you are not getting yourself in trouble. Certified units are required to carry an FCC ID number that you can verify.

When someone prints that their equipment “Meets or Exceeds the FCC Part 15 Rules,” ask them which one it is. You want one that “meets” them, is Certified, and has an FCC ID number to prove it. The ID number is *required* to be printed on the device. If they do not have an ID number, or sound fishy when trying to find it for you, ask them their registered name and look it up. The FCC has a database on-line: <https://gullfoss2.fcc.gov/prod/oet/cf/eas/reports/GenericSearch.cfm> that allows you to search by ID number, manufacturer name, etc.

Please do that. It will give you a couple of pieces of good information. Not only will you be able to verify the ID number given is real, but you will be able to verify the manufacturer or company that submitted it for Certification, and the date when this was done. All of this information will help you make sure that you are dealing with a legitimate legal product and a legitimate manufacturer or vendor. If you do not find the ID number, walk away from the deal—no matter how good it seems—it is not a good one.

As an example, I did a random web search and found the FCC label below. It shows you exactly what should be included - the FCC ID number, and the Part 15 compliance statements as well as any additional information for Canadian or other certifications.



When one submits a device for testing, you create and submit the intended ID number for reference during testing. You are not to use that device (or ID) for sale unless it passes the testing. I know of one manufacturer that sold their products using a test ID number, despite the FCC having rejected the device! But you would only know it if you checked up on them. The FCC knew about this situation, and (I was told) requested the company cease. The company went on to sell hundreds (at least) of these units with the ID number printed on them, and claimed the device was legal.

The company has since changed ID numbers and sells slightly different equipment (I assume it is now within FCC spec). The only way you, as a buyer, could know this would be to check the FCC on-line database—or if the FCC actually raided and shut down the company—which happens very rarely. And then there are the folks who will be straight with you about their legal standing—I will not print the URL for a pirate shop—you can find them quick enough with a search engine.

LET ME SHOW YOU THIS BRIDGE

Another common bit of misinformation practiced by some folks is the modification of antennas so devices that were compliant with the Rules are no longer—but hey, they get much better coverage now! The FCC is pretty clear about detachable antennas, amps and the like (Part 15.203 & 15.204).

Some companies sell a legal device (or close enough that no one bugs them) but then offer “after market” kits for them. Common ones are long transmission lines and rooftop antennas, or in-line amplified antennas, for devices that were Certified by the FCC labs *without* these additional components. Remember that *you* are responsible when the Federales come knocking. Yes, the ID number may be on the device, but it is not on that nifty ground plane antenna with a ton of gain! The golden rule remains, “If it seems too good to be true, it usually is.”

The Rules for FM and AM devices specify the types of connections, the lengths of antennas, the lengths of grounds and transmission lines. Again, since you read the Rules first, you will know this information and be able to run rings around the salesperson. Make them explain to you just how their additional cables and antennas are compliant with the FCC regulations.

THE TRUTH IS OUT THERE

If you want the “complete” view of the FCC on the issue of low power transmission systems, you need to download and read their Bulletin 63 from The Office of Engineering & Technology, which you can do at http://www.fcc.gov/Bureaus/Engineering_Technology/Documents/bulletins/oet63/oet63rev.pdf. Please note that it is very dated in some areas, having been last revised in 1996. It does, however, provide a nice overview of the whole concept of low power systems.

Another nice resource—Compliance Engineering Magazine has a set of helpful rules at <http://www.ce-mag.com/99ARG/Gubish31.html>. Although it does include other parts, it gives a nice comparison of the Canadian and US Low Power Unlicensed Rules and reviews some of the more important technical issues. I have not delved into Industry Canada certifications, but they are very similar to FCC Part 15 Regulations and you can often find devices that are dual certified (folks like Decade, for example, have FCC and RSS ID numbers on their devices).

Use the internet to learn about different installations and their success. There are a lot of low power sites out there, many with forums to chat about ideas. Remember, though, *you* are now armed and dangerous. Share your knowledge and your resources by gently correcting errors and quoting sources!

EVERYTHING IS POSSIBLE ... WITHIN REASON

There *are* limitations to low power broadcasting, and they stem from a simple fact: a licensed station will always blow you off the dial. They simply have more power and the legal freedom to do things you cannot. So what? Kick them in the kneecaps—or wherever else you have to—to gain an advantage. They probably will not be interested in “local” and “community” issues and service. You can—and should be. As you start to win the audience away from the voice tracked automation station on Main Street, they will try to stop you with their main weapon: The FCC.

But you, unlike them, will actually have read this column, used the links and done your homework. The FCC will come in and say, “Wow! You have a nice setup here and it’s perfectly legal.” And then they will be on their merry way—unlike when you ask them to look at that “local” automated station with no EAS, no Public File, and a light out on the tower.

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